

## CLAIMS:

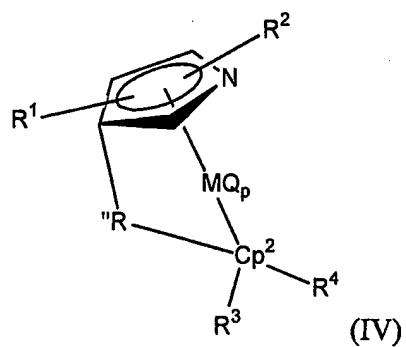
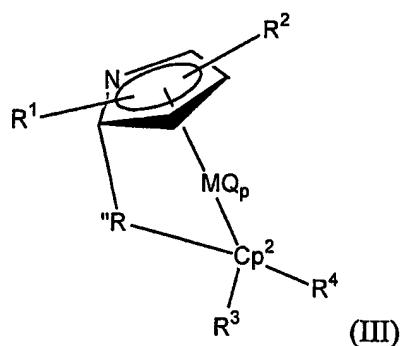
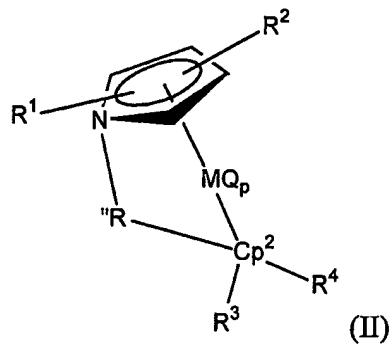
1. A catalyst component for producing a polyolefin, which catalyst component comprises a metallocene catalyst having a structure according to a formula (I):

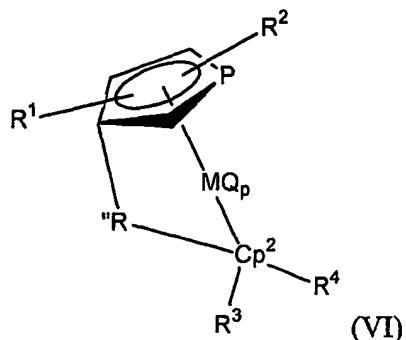
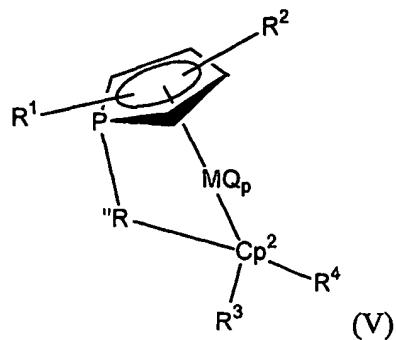


wherein  $\text{Cp}^1$  and  $\text{Cp}^2$  are each independently a cyclopentadienyl derivative which may be substituted or unsubstituted and are selected from cyclopentadienyl groups, indenyl groups and fluorenyl groups, provided that at least one of the cyclopentadienyl derivatives comprises an N atom or a P atom in its cyclopentadienyl ring;  $\text{R}''$  is a structural bridge to impart stereorigidity between  $\text{Cp}^1$  and  $\text{Cp}^2$ ; and when only one of  $\text{Cp}^1$  and  $\text{Cp}^2$  comprises a P atom in its cyclopentadienyl ring,  $\text{R}''$  is attached to that phosphorous atom, or is attached to a carbon atom in the cyclopentadienyl ring distal to that phosphorous atom; and when one of  $\text{Cp}^1$  or  $\text{Cp}^2$  comprises an indenyl group and the other of  $\text{Cp}^1$  and  $\text{Cp}^2$  comprises an indolyl group,  $\text{R}''$  is attached either directly to the N atom of the indolyl group or to a carbon atom that is vicinal to the N atom; M is a metal from Group IIIB, IVB, VB or VIB; Q is a hydrocarbyl group having from 1-20 carbon atoms, or a halogen; and p is the valence of M minus 2.

2. A catalyst component according to claim 1, in which  $\text{Cp}^1$  or  $\text{Cp}^2$  comprises a nitrogen atom in the cyclopentadienyl ring, and  $\text{R}''$  is attached to the nitrogen atom, to a carbon atom vicinal to the nitrogen atom, or to a carbon atom non-vicinal to the nitrogen atom.
3. A catalyst component according to claim 1 or claim 2, which component comprises a metallocene catalyst of formula (I) in which  $\text{Cp}^1$  and  $\text{Cp}^2$  are independently selected from cyclopentadienyl groups, and fluorenyl groups.

4. A catalyst component according to any preceding claim, which component has a formula selected from the following formulae (II)-(VI):





wherein  $R^1$ ,  $R^2$ ,  $R^3$  and  $R^4$  are substituents and may be the same or different.

5. A catalyst component according to any preceding claim, wherein  $Cp^1$  comprises a cyclopentadienyl group and  $Cp^2$  comprises a fluorenyl group.
6. A catalyst component according to claim 3, wherein both  $Cp^1$  and  $Cp^2$  comprise indenyl groups.
7. A catalyst component according to any preceding claim, wherein M is Ti, Zr, Hf, or V.
8. A catalyst component according to any preceding claim, wherein p is 2.
9. A catalyst component according to any preceding claim, wherein O is Cl.

10. A catalyst component according to any preceding claim, wherein R" is substituted or unsubstituted and comprises a group selected from an alkylene derivative having from 1-20 carbon atoms, a dialkyl germanium derivative, a dialkyl silicon derivative, a dialkyl siloxane derivative, an alkyl phosphine derivative or an amine derivative.
11. A catalyst component according to claim 10, wherein R" comprises an Me<sub>2</sub>Si derivative or an Et derivative.
12. A catalyst component according to any preceding claim, wherein the substituents on the Cp<sup>1</sup> and/or Cp<sup>2</sup> derivatives are independently selected from aryl derivatives having from 1-20 carbon atoms, hydrocarbyl derivatives having from 1-20 carbon atoms, cycloalkyl derivatives, silane derivatives, alkoxy derivatives and halogens.
13. A catalyst component according to claim 12, wherein the substituents on the Cp<sup>1</sup> and/or Cp<sup>2</sup> derivatives are independently selected from Ph, Bz, Naph, Ind, BzInd, Me, Et, n-Pr, i-Pr, n-Bu, t-Bu, and Me<sub>3</sub>Si.
14. A catalyst component according to claim 13, wherein the substituents comprise methyl groups.
15. A catalyst component according to any preceding claim, wherein the metallocene catalyst is immobilised on a solid support.
16. A catalyst system comprising a catalyst component as defined in any preceding claim, and further comprising an aluminium- or boron-containing co-catalyst capable of activating the catalyst component.
17. A method for producing a polyolefin, which method comprises polymerising an olefin monomer in the presence of a catalyst component or catalyst system as defined in

18. A method according to claim 17, wherein the olefin monomer is ethylene or propylene.
19. A polyolefin, obtainable according to a method as defined in claim 17 or claim 18.
20. Use of a catalyst component or catalyst system as defined in any of claims 1-16 for the preparation of a polyolefin.
21. Use according to claim 20 for the preparation of a polyethylene or a polypropylene.